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EFFECTS OF COMPETING VEGETATION ON GROWTH OF LOBLOLLY PINE PLANTATIONS IN THE WEST GULF COASTAL PLAIN

Dean W. Coble¹

Competing woody vegetation negatively affects the growth of planted loblolly pine (*Pinus taeda* L.) trees by seizing site resources that otherwise would be used by the planted trees (Burkhart and Sprinz 1984). The West Gulf coastal plain represents a range of growing conditions from lower coastal plain to upland sites that host a variety of vegetation that compete with planted loblolly pine. Estimation of the productivity of these plantations requires that the effect of woody competition on planted tree growth be better understood across this range of growing conditions. In order to quantify the effects of competing woody vegetation on planted loblolly pine, competing woody vegetation has been measured on 127 permanent growth and yield plots since 2004. These study sites are part of the East Texas Pine Plantation Research Project and located in east Texas and western Louisiana. Treatment plots are 0.23-acre squares (100- by 100-feet) and are located across a range of soil types, soil drainage classes, and site preparation practices that characterize intensively managed plantations in the West Gulf region. Woody competing vegetation was tallied on four nested subplots [1/40th acre circular plots for woody competition > 1-inch d.b.h. (saplings) and 1/200th acre circular plots for all other woody competition < 1-inch d.b.h. (understory)] located within each 0.23-acre plot. Woody competition was quantified four ways to evaluate the influence on planted pine basal area per acre: (1) ratio of sapling basal area per acre to the total (planted pine plus sapling) basal area per acre (Burkhart and others 1987, Lee and Coble 2002); (2) basal area per acre of saplings; (3) linear feet of understory; and (4) total linear feet of saplings and understory. Regression analysis was used to compare these measures of woody competition to the basal area per acre of planted pine. Dominant height (feet) and plantation age

(years) were included in the analysis as covariates to account for variability in site productivity and stage of development, respectively. The analysis found that total linear feet of all woody competition was the strongest measure of competition that negatively impacted planted pine basal area per acre. Total linear feet of all woody competition most likely represented woody competition better than the other measures in this study because yaupon (*Ilex vomitoria* Aiton) was the most abundant competing species in these young plantations (average age = 5.4 years). At younger ages, yaupon rootstocks produce abundant multiple stems that compete for available growing space. These stems are not large in diameter and therefore have low basal area; however, they can overtop and out-compete planted pine. Total linear feet best represented the effects of competing woody vegetation on planted pine in the early stages of development in plantations represented in this study. Future research will focus on refining methodologies for quantifying competing woody vegetation and its effects on loblolly pine growth. Total linear feet of competing woody vegetation may be used as an additional parameter in future growth models.

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